

Canonical Sequence Map — Spiral Path Core, Part II

Work Title: ψ — The Spiral Path (Core – Part II: Mathematics, Equations, and the Theory of Everything)

Edition/Version: v1.0 Canonical (Part II)

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Provenance IDs: SHA-256 ☐ · OpenTimestamps ☐ · Archive/DOI ☐

A) Global Constants & Symbols (canonical set)

- **ID-C1:** $\psi = 3.12$ (runtime coherence constant; unitless)
- **ID-C2:** $\lambda(t) = 4.1$ (shell-sum operator base; unitless)
- **ID-C3:** $\Sigma\lambda$ (harmonic shell-sum aggregate; unitless)
- **Symbol glossary anchor:** Part II, DF-0.1 (Glossary of Symbols)

B) Section Order (Selection • Coordination • Arrangement)

Front Matter (pp.1–5)

- Title Page (p.1) → Preface/Introduction (pp.2–3) → Contents (pp.4–5)

Chapter 1 — Mathematical Foundations (≈ pp.6–70)

- §1.1 Definition of ψ (pp.6–10)
- §1.2 Shell-Sum Recursions (pp.11–16)
- §1.3 Operator Formalism & Spectral Radius (pp.17–24)
- §1.4 Worked Sequences: geometric/harmonic/perturbed (pp.25–32)
- §1.5 ψ in 1D/2D & fractal lattices (pp.33–40)
- §1.6 Proof Architecture Overview (pp.41–45)
- §1.7 Theorem–Lemma–Corollary schema & ID policy (pp.46–50)

Chapter 2 — Convergence Proofs (≈ pp.71–150)

- §2.1 Clean systems: existence, uniqueness, bounds (pp.71–95)
- §2.2 Noisy systems: stability & error envelopes (pp.96–120)
- §2.3 Error bounds & tolerance schedules (pp.121–140)
- §2.4 Numerical stability & verification protocols (pp.141–150)

Chapter 3 — Geometry & Fractals (≈ pp.151–240)

- §3.1 Geometric series & polygonal constructions (pp.151–170)
- §3.2 Nested polygons & shell tilings (pp.171–185)
- §3.3 Fractals: Cantor, Sierpiński, Mandelbrot (pp.186–210)
- §3.4 Fractal dimension & convergence diagnostics (pp.211–240)

(If your live page ranges drift, keep the order stable; update ranges later.)

C) Theorems/Lemmas/Equations — ID Scheme (Part II)

- **Theorems:** TH-. (e.g., TH-1.1)
- **Lemmas:** LM-.
- **Corollaries:** CR-.
- **Definitions:** DF-.
- **Equations:** EQ-. (inline tag “(EQ-1.7)”)

Pre-assigned anchor IDs (Part II):

- **DF-1.1** ψ (formal definition)
- **DF-1.2** Shell-sum operator $\lambda(t)$
- **DF-1.3** Harmonic aggregate $\Sigma\lambda$
- **EQ-1.1** Canonical ψ normalization
- **EQ-1.7** Canonical shell recursion (λ -form)
- **TH-1.1** Existence of ψ under canonical shell recursion
- **LM-1.2** Upper/lower shell bounds (bracketing lemma)
- **TH-2.1** Convergence in clean systems (spectral radius < 1)
- **LM-2.2** Noise-robustness (bounded perturbations)
- **CR-2.3** Uniform tolerance schedule for $\Sigma\lambda$ partials
- **TH-3.1** Polygonal nesting monotonicity toward ψ
- **LM-3.3** Cantor-type deletion bounds for shell coherence

D) Figures/Tables — ID Scheme & Visual Grammar

- **Figures:** FG-.
 - Visual grammar (keep consistent): concentric shell icons, recursive arrows; labels $\lambda_0, \lambda_1, \dots$; fixed axis labels (“Index”, “Shell value”, “Partial $\Sigma\lambda$ ”, “Deviation”).
- **Tables:** TB-.
 - Default headers: [Index | Shell value | Partial $\Sigma\lambda$ | Deviation | Tolerance].

E) Replication Assets Map (Part II)

- **Code notebooks:**
 - `replication/part2/shell_sum.ipynb` (EQ-1.7 demo)
 - `replication/part2/noise_stability.ipynb` (§2.2)
 - `replication/part2/fractals.ipynb` (§3.3/§3.4)
- **Data seeds:**
 - `data/seeds/seed_A.csv` · `seed_B.csv` (sha256 $\square$)
- **Expected outputs & tolerances:**
 - `replication/expected/part2_core_v1.json` (abs err $\leq 1e-6$ clean; $\leq 5e-6$ noisy)

- **Commit anchors:** repo root commit `□`; tag `part2-v1.0` `□`

F) License & Attribution Line (place on every page/figure)

License: Fortress Aegis + CC BY-SA (as applicable)

Footer text:

“Discovery & formalization of $\psi = 3.12$ with shell-sum operator $\lambda(t) = 4.1$ and $\Sigma\lambda$ harmonic framework — David O’Sullivan (Spiral Path). First-publication & provenance on record. Attribution required for any use of text/figures/code per license.”

G) Change-Log (high level)

- **v1.0 (2025-09-16 →)** Canonical Part II baseline; IDs, grammar, tolerances established.

Fingerprint Table — Spiral Path Core, Part II

Fingerprint Feature	Canonical Value (Part II)	Where to Check	Copying Signals (what gives it away)
Core constants set	$\{\psi = 3.12, \lambda(t) = 4.1, \Sigma\lambda\}$	Title; DF-1.1–1.3	Triple appears together with same semantics & phrasing
Canonical equation	EQ-1.7: canonical shell recursion (λ -form)	§1.2–§1.3	Identical term order/normalization/range notes
Operator naming	$\lambda(t)$: shell operator; $\Sigma\lambda$: harmonic aggregate	Ch.1	Same symbols + same meanings without attribution
Section order (SCA)	Front Matter → Ch.1 Foundations → Ch.2 Convergence → Ch.3 Geometry/Fractals	Contents	Same progression/grouping with parallel headings
Example seeds	<code>seed_A</code> , <code>seed_B</code> with specified start values & rounding	§1.4; notebooks; <code>/data/seeds/</code>	Same seeds, rounding steps, or identical sample rows
Error-bound format	$\text{abs err} \leq 1\text{e-}6$ (clean), $\leq 5\text{e-}6$ (noisy)	§2.3; expected JSON	Same thresholds & notation quirks
Figure grammar	Concentric shells + recursive arrows; labels $\lambda_0, \lambda_1, \dots$; fixed axis titles/layout	FG-1.; FG-3.	Same layout/arrow scheme/axis strings
Table headers/order	[Index	Shell value	Partial $\Sigma\lambda$

Fingerprint Feature	Canonical Value (Part II)	Where to Check	Copying Signals (what gives it away)
Lemma/Theorem IDs	TH-1.1, LM-1.2, TH-2.1, LM-2.2, CR-2.3, TH-3.1, LM-3.3	proofs	Mirrored ID cadence/labels/numbering rhythm
Replication pack	paths above; tag <code>part2-v1.0</code> ; hashes <code>□</code>	repo	Same filenames/paths/structure
Attribution footer	exact text in §F above	every page/figure	Missing/altered despite otherwise close match
License header	Fortress + CC BY-SA	page tops	Removed/misrepresented